Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

CNL-19-011

January 16, 2019

10 CFR 50.90

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Browns Ferry Nuclear Plant, Units 1, 2, and 3
Renewed Facility Operating License Nos. DPR-33, DPR-52, and DPR-68
NRC Docket Nos. 50-259, 50-260, and 50-296

Subject: **Proposed Technical Specifications (TS) Change TS-510 - Request for License Amendments - Maximum Extended Load Line Limit Analysis Plus - Supplement 6, Additional Operator Training Results**

References:
1. Letter from TVA to NRC, CNL-18-002, "Proposed Technical Specifications (TS) Change TS-510 - Request for License Amendments - Maximum Extended Load Line Limit Analysis Plus," dated February 23, 2018 (ML18057B276)

2. Letter from NRC to TVA, “Browns Ferry Nuclear Plant - Request for Additional Information Regarding Maximum Extended Load Line Limit Analysis Limit Plus License Amendment Request (EPID: L-2018-LLA-0048),” dated November 20, 2018 (ML18312A427)

3. Letter from TVA to NRC, CNL-18-139, “Proposed Technical Specifications (TS) Change TS-510 - Request for License Amendments - Maximum Extended Load Line Limit Analysis Plus - Supplement 3, Responses to Requests for Additional Information,” dated December 14, 2018

By the Reference 1 letter, Tennessee Valley Authority (TVA) submitted a request for a Technical Specification (TS) amendment (TS-510) to Renewed Facility Operating License Nos. DPR-33, DPR-52, and DPR-68 for Browns Ferry Nuclear Plant (BFN) Units 1, 2, and 3, respectively. The proposed amendment allows operation in the expanded Maximum Extended Load Line Limit Analysis Plus (MELLLA+) operating domain and use of the Detect and Suppress Solution - Confirmation Density (DSS-CD) stability solution. During their technical review of the LAR, the Nuclear Regulatory Commission (NRC) identified the need for additional information. The Reference 2 letter provided, in part, NRC Requests for Additional Information (RAIs) related to human factors. The Reference 3 letter provided the responses to these NRC RAIs. In the response to NRC APHB RAI-3, TVA indicated that specific crew times for recognition of an Anticipated Transient Without Scram (ATWS) following a dual recirculation pump trip (2RPT) would be provided by January 18, 2019. The enclosure to this letter provides the specific crew times for recognition of an ATWS following a 2RPT.

Additionally, with respect to proprietary markings in the BFN MELLLA+ LAR, information contained in the first paragraph, fourth and fifth sentences, of the Condensation Oscillation subsection of Section 4.1.2.1 of NEDC-33877P, Safety Analysis Report for Browns Ferry Nuclear Plant Units 1, 2 and 3 Maximum Extended Load Line Limit Analysis Plus, Revision 0, was identified as proprietary in Attachment 5 of the BFN MELLLA+ License Amendment Request (Reference 1). Based on further review by General Electric-Hitachi, it has been determined that certain information in these sentences should be considered to be non-proprietary. Specifically, in the fourth sentence of the first paragraph, the information that is considered to be non-proprietary is "The Mark I containment CO load definition was developed from the test data from Full Scale Test Facility (FSTS) tests (Reference 35) to simulate LOCA thermal-hydraulic conditions." The remainder of this sentence is considered to be proprietary. With respect to the fifth sentence in the first paragraph, "The tests are bounding for all US Mark I containment plants, including BFN," the entire sentence is considered to be non-proprietary.

TVA has reviewed the information supporting a finding of no significant hazards consideration and the environmental consideration provided to the NRC in the Reference 1 letter. The supplemental information provided in this submittal does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. In addition, the supplemental information in this submittal does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed license amendment. Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter to the Alabama State Department of Public Health.

There are no new regulatory commitments associated with this submittal. If there are any questions or if additional information is needed, please contact Michael A. Brown at (423) 751-3275.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 16th day of January 2019.

Respectfully,

E. K. Henderson
Director, Nuclear Regulatory Affairs

Enclosure: Specific Crew Times for recognition of an Anticipated Transient Without Scram Following a Dual Recirculation Pump Trip

cc:
NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Browns Ferry Nuclear Plant
State Health Officer, Alabama Department of Public Health

ENCLOSURE

Specific Crew Times for Recognition of an Anticipated Transient Without Scram Following a Dual Recirculation Pump Trip

The specific crew times for recognition of an Anticipated Transient Without Scram (ATWS) following a dual recirculation pump trip (2RPT) are provided below.

BFN ATWS Actions Timing Data - Licensed Operator Requalification 2018/2019

Crew	**Time for Recognition of ATWS Following 2RPT (seconds)**
Group 0	N/A*
Group 1A	19.0
Group 1B	17.25
Group 1C	20.0
Group 2A	25.25
Group 2B	14.0
Group 2C	13.75
Group 3A	23.75
Group 3B	17.75
Group 3C	31.25
Group 4A	19.5
Group 4B	19.0
Group 4C	16.0
Group 5A	15.75
Group 5B	41.25
Group 5C	15.75
Average Time (seconds)	20.7

* During Licensed Operator Requalification training 2018 Cycle 6, in which this data was obtained, there was no Group 0. This group, consisting of Operations Management and staff, attended training with various other groups during the training cycle.

The above operator response times were determined during a simulated event in which both Recirculation Pumps tripped from 100% reactor thermal power. The crews were not informed that they would have a 2RPT and were not informed any timing information was being gathered.

All crews were measured against a performance criteria of 60 seconds from the 2RPT to the recognition of the ATWS. The 60 second response time for operator action to manually scram is the time assumed in the ATWS with Core Instability analysis.

All crews completed the action well within the required time of 60 seconds with no problems or failures identified. As such, no remediation was required.

The operator response times in the above table, along with the previously submitted operator response times for initiation of water level reduction following recognition of an ATWS provided in the Reference 1 letter, constitute the total operator response time from a 2RPT to the initiation of reduction of reactor water level following an ATWS. Adding the longest response time from the table above to the longest response time from the previously submitted operator response time for initiation of lowering reactor water level (provided in Reference 1) yields a total longest response time of 101.7 seconds, which is well below the 180 seconds assumed in the ATWS with Core Instability analysis.

Reference

1. Letter from TVA to NRC, CNL-18-139, “Proposed Technical Specifications (TS) Change TS-510 - Request for License Amendments - Maximum Extended Load Line Limit Analysis Plus - Supplement 3, Responses to Requests for Additional Information,” dated December 14, 2018